Leo Leroy Beranek FREE

Special Collection: Print Obituaries

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host. Neither of us would be where we are in our careers if it were not for Alex. But you had to have time on your hands when you entered his office. Alex was a treasure trove of stories that he liked to regale you with. We always tried to get him to write his memoirs, but he refused, saying that he was such an honest guy that there would be too many people he would offend by doing so. We regret now not having written down the many wonderful stories he told.

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Leo Leroy Beranek

Leo Leroy Beranek, a global leader in acoustics, noise control, and concert hall design, passed away in his home in Westwood, Massachusetts, on 10 October 2016.

Born in Solon, Iowa, on 15 September 1914, Leo graduated from Cornell College in 1936 with a BA degree in math and physics. He was admitted into the doctoral program at Harvard University, where he worked under Frederick Hunt. His DSc degree was awarded in 1940 for his work on acoustic impedance; Leo developed a method for measuring it as part of his thesis and presented examples for many acoustical materials.

BOB LOTZ

Leo Leroy Beranek

The National Defense Research Committee established in 1940 the Harvard Electro-Acoustics Laboratory, and Leo was its director until 1946. The laboratory provided civilians the opportunity to work on military acoustical problems. Lightweight, sound-absorptive materials with a high ratio of surface to volume were needed to lower noise levels in airplane cockpits. Leo worked with a manufacturer to produce the materials. He helped design headsets and other devices to allow good communication in the presence of noise. The government needed echo-free space to test high-intensity noise sources, so Leo developed fiberglass wedges for use in what became known as anechoic chambers. Such rooms are still being built and used worldwide for electro-acoustic testing and determination of the noise emissions of products. While at Harvard, Leo received a Guggenheim fellowship to write his first book, *Acoustic Measurements*, published in 1949. The revised edition in 1998 contained a great deal of new information.

In 1947 Leo joined the MIT faculty as an associate professor for communications engineering. He taught a course on electrical network theory in the summer of 1951 and adapted that theory to the design of electro-acoustical networks. That led to the publication of his book *Acoustics* in 1954. The book also contained information on noise control and especially criteria for noise-control design, one of Leo's longtime interests. While at MIT, he established a series of noise-control courses for people working in industry. His 1960 book *Noise Reduction* came out of those courses. Later, his books *Noise and Vibration Control* in 1971 and *Noise and Vibration Control Engineering: Principles and Applications* with István Vér in 1992 became valuable sources of noise-control engineering information.

In 1948 Leo partnered with Richard Bolt, an MIT professor with training in physics and architecture, to found a consulting firm. Later, Robert Newman, an architect, was added, and the firm became Bolt Beranek and Newman (BBN). The first job was acoustical consulting for the United Nations building in New York. Among the many additional projects was successfully designing a very large muffler for the National Advisory Committee for Aeronautics (the forerunner of NASA) for a supersonic wind tunnel in Cleveland, Ohio. Leo described the noise situation before the muffler's installation: "The noise sounded like a series of thunderous explosions, even at distances as far as 5 or 10 miles away."

At the beginning of the jet age, noise from jet airplanes was rightly perceived to be louder than that from propeller planes. In his work with the Port of New York Authority, Leo established measures to reduce jet noise and, with others, developed a new noise metric called effective perceived noise level, or EPNdB, a variation of which is still used today in the certification of noise levels of commercial airplanes.

In 1955 Leo led the diversification of BBN into computer science, including hiring J. C. R. Licklider. BBN's contract with the Advanced Research Projects Agency led to the development of a packet-switching network that became ARPANET, the precursor of the internet.

Throughout his life Leo studied and consulted on the propagation, reflection, and absorption of sound in many of the world's best concert halls and on the effects of the sound fields on both the audience and performers. His books include *Concert and Opera Halls: How They Sound* (1996) and *Concert Halls and Opera Houses: Music, Acoustics, and Architecture* (2004).

While Leo was president of the Acoustical Society of America in 1954–55, he launched a technical journal, *NOISE Control*. In 1971 he and William Lang were leaders in the founding of the Institute of Noise Control Engineering (INCE-USA). During his presidency in 1972, INCE-USA established a series of international congresses called INTER-NOISE. Actions by Leo at the first congress led the federal government to pass the Noise Control Act of 1972. Leo also led the launch of the technical publication *Noise Control Engineering Journal*.

His final book, *Acoustics: Sound Fields and Transducers*, was written with Tim Mellow and published in 2012. It was a complete rewrite of the electro-acoustical and sound-field portions of his 1954 book *Acoustics*, with emphasis on the computer programming of the equations.

Leo received many honors and awards during his lifetime. Among them were the US President's Certificate of

Merit in 1948 for contributions to the US research effort during World War II and the National Medal of Science in 2002.

Extremely active in the affairs of the Boston Symphony Orchestra, Leo had a special concert in his honor on his 100th birthday. He was an excellent skier and used short skis long before they became popular. He particularly enjoyed skiing in the Swiss Bernese Oberland and in Alta, Utah, and continued to ski up to age 89.

Leo is greatly admired by his colleagues for his contributions to acoustics and the many initiatives he created. As a prolific author and mentor to many, he reached out to others and was willing to share his technical insights. He was a kind, thoughtful, and engaging gentleman during both social and technical occasions.

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Cornelis A. Gehrels

Cornelis A. "Neil" Gehrels, an innovator in gamma-ray astrophysics and an accomplished leader of satellite missions for both NASA and the European Space Agency (ESA), passed away on 6 February 2017 following a recurrence of pancreatic cancer.

Born on 3 October 1952 in Lake Geneva, Wisconsin, Neil went to the University of Arizona, where he initially pursued an undergraduate degree in music and later added physics as a double major. He received his degree in 1976. His research interests won out, and under the direction of Edward Stone, Neil earned a PhD from Caltech's Space Radiation Laboratory in 1982. In 1981 he and his wife moved to Maryland, and Neil arrived as a postdoc at NASA's Goddard Space Flight Center, where he would spend the rest of his career.

At Goddard, Neil embraced the emerging field of gamma-ray astrophysics. He joined a team that developed a coded-aperture imaging system for the Gamma-Ray Imaging Spectrometer (GRIS) balloon payload. The instrument offered significantly better sensitivity and source localization than did previous balloon and satellite experiments. Astronomers had discovered a supernova in the Large Magellanic Cloud on 23 February 1987—the closest visible supernova since the invention of the telescope. On a rushed maiden voyage in May 1988, GRIS detected gamma rays from the decay of cobalt-56, with a half-life of 77 days, in the remnants of SN 1987A. That observation provided the first solid proof that nucleosynthesis was occurring in supernovae.

Neil was the project scientist for the *Compton Gamma Ray Observatory*, launched in 1991 as the second of four in NASA's Great Observatories program. *Compton* established that gamma-ray bursts (GRBs)—brilliant, brief flashes of energetic radiation—formed two distinct classes of extragalactic explosions. Neil also served as the US mission scientist for ESA's *INTEGRAL* satellite laboratory and was a deputy project scientist for NASA's *Fermi Gamma-Ray Space Telescope*, which has been operating since 2008. In a change of pace, he also was the project scientist for NASA's *Wide Field Infrared Survey Telescope*, a mission designed to study dark energy and slated for launch in the 2020s.

Neil is best remembered for his work as principal investigator of NASA's *Swift* mission. The *Swift* satellite launched in 2004 with a complement of gamma-ray, x-ray, and UV telescopes designed to provide rapid, precise localizations for high-energy transients, particularly GRBs. Neil oversaw 12 years of operations that would make *Swift* one of NASA's most scientifically productive missions. The satellite's localization of short GRBs allowed detailed follow-up observations, which supported the hypothesis that the GRBs had their origin as merging neutron stars. *Swift* also discovered the first "break out" and early expansion of supernova shock waves, detected a star that was disrupted by a massive black hole and produced a relativistic jet, and identified several long GRBs from some of the very first stars in the universe.

NASA

Cornelis A. Gehrels

Among Neil's honors were the NASA Exceptional Scientific Achievement Medal, the NASA Outstanding Leadership Medal, and Goddard's John C. Lindsay Memorial Award. Neil and the *Swift* team received the 2007 Rossi Prize from the American Astronomical Society, and he was awarded the 2009 Henry Draper Medal from the National Academy of Sciences. He was also one of three astronomers awarded the 2017 "future" Dan David Prize, which honors "achievements having an outstanding scientific, technological, cultural or social impact on our world."

In addition to his scientific accomplishments, Neil will be remembered for his superb organizational skills, keen insight, and warm personality. Those attributes enabled him to shepherd technically and politically demanding space missions, composed of large, diverse scientific teams, through the complex maze of planning, construction, and operations.

In his free time, Neil was an avid hiker and mountaineer who often would find new exploring opportunities during trips to scientific conferences. In 2006 and 2015, he summited Yosemite National Park's El Capitan in six-day solo ascents via the Nose route. With his family, he volunteered in disadvantaged communities around Goddard, and in 2005 Neil helped establish an internship program for local high school students with hardships.

His friends, colleagues, and the astronomical community as a whole will miss his deep knowledge, determination, and generous spirit.

S. Bradley Cenko
Francis Reddy
NASA's Goddard Space Flight Center
Greenbelt, Maryland